

Physical Education  
COMPONENT 1: Fitness and Body Systems

Total Marks
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Time: 1 hour 45 minutes

In the boxes below, write your name, centre number and candidate number.

Surname					
Other names					
Centre Number					
Candidate Number					

**YOU MUST HAVE**

**Nil**

**YOU WILL BE GIVEN**

**Diagram Booklet**

**INSTRUCTIONS**

**Answer ALL questions.**

**Answer the questions in the spaces provided in this Question Paper or in the separate Diagram Booklet – there may be more space than you need.**

**INFORMATION**

**The total mark for this paper is 90.**

**The marks for EACH question are shown in brackets – use this as a guide as to how much time to spend on each question.**

**There may be spare copies of some diagrams.**

**ADVICE**

**Read each question carefully before you start to answer it.**

**Try to answer every question.**

**Check your answers if you have time at the end.**

**Answer ALL questions.**

**Write your answers in the spaces provided.**

**Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.**

**1 Look at FIGURE 1 for Question 1(a) in the Diagram Booklet. It shows part of the structure of the skeletal system.**

**(a) Which ONE of the following is the name of the bone labelled X in FIGURE 1?  
(1 mark)**

- ☐ A Carpal
- ☐ B Cervical
- ☐ C Clavicle
- ☐ D Cranium

**(continued on the next page)**

**1 continued.**

**(b) Which ONE of the following is the role of tendons?  
(1 mark)**

- ☐ **A Tendons join bone to bone**
- ☐ **B Tendons join ligaments to bone**
- ☐ **C Tendons join muscle to bone**
- ☐ **D Tendons join muscle to muscle**

**(c) Which ONE of the following muscles contracts to  
bring about EXTENSION at the HIP?  
(1 mark)**

- ☐ **A Biceps**
- ☐ **B Gluteus maximus**
- ☐ **C Latissimus dorsi**
- ☐ **D Quadriceps**

**(continued on the next page)**

**1 continued.**

**(d) Which ONE of the following is a characteristic of TYPE IIX muscle fibres?**  
**(1 mark)**

- ☐ **A They are very fatigue resistant**
- ☐ **B They have a large capillary network**
- ☐ **C They produce a large amount of force**
- ☐ **D They work aerobically**

**(continued on the next page)**

**1 continued.**

**Look at Table 1 for Question 1(e) in the Diagram Booklet. It shows ratings for the grip dynamometer test for teenagers aged 16 to 19.**

**(e) Which ONE of the following is the correct rating for a female, who scored 32 in the grip dynamometer test?**  
**(1 mark)**

☐ **A    Excellent**

☐ **B    Good**

☐ **C    Average**

☐ **D    Fair**

**(continued on the next page)**

**1 continued.**

**Look at FIGURE 2 for Question 1(f) in the Diagram Booklet. It shows an individual's resting blood pressure as blood travels through the different types of blood vessels in the body.**

**(f) Which ONE of the following, A, B, C or D represents the blood pressure as the blood leaves the heart?  
(1 mark)**

☐ **A**

☐ **B**

☐ **C**

☐ **D**

**(continued on the next page)**

**1 continued.**

**(g) Which ONE of the following terms means the amount of blood leaving the heart per minute?  
(1 mark)**

☐ **A Cardiac output**

☐ **B Stroke volume**

☐ **C Tidal volume**

☐ **D Vital capacity**

**(continued on the next page)**



**1 continued.**

**(h) Which ONE of the following, A, B, C or D, shows the correct movement of gases into and out of the alveoli during gaseous exchange?**  
**(1 mark)**

☐ **A     $O_2$  out,  $CO_2$  out**

☐ **B     $O_2$  in,  $CO_2$  in**

☐ **C     $O_2$  out,  $CO_2$  in**

☐ **D     $O_2$  in,  $CO_2$  out**

**(Total for Question 1 = 8 marks)**

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- 2 Look at FIGURE 4 for Question 2(a) and Question 2(b) in the Diagram Booklet. It shows the muscular system.**

**Complete TABLE 2 in the Diagram Booklet by:**

- (a) Stating the name of the labelled muscles.  
(2 marks)**
- (b) Stating the function of the labelled muscles.  
(2 marks)**
- (c) State ONE reason why skeletal muscles are  
classified as VOLUNTARY muscles.  
(1 mark)**

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**2 continued.**

- (d) Explain, using an example, why INVOLUNTARY muscles are important during sport and physical activity.  
(3 marks)**

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**2 continued.**

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**(Total for Question 2 = 8 marks)**

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**3 Games players constantly change direction when playing their sport.**

**(a) (i) State the component of fitness games players use to quickly change direction.  
(1 mark)**

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**(ii) State the name of the fitness test that measures how quickly you can change direction.  
(1 mark)**

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**3 continued.**

- (b) Explain why the role of ligaments is important to games players.  
(2 marks)**

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**3 continued.**

**One of the functions of the cardiovascular system is to help regulate body temperature.**

- (c) Explain why the cardiovascular system needs to regulate a games player's body temperature when they play sport.  
(4 marks)**

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**3 continued.**

**(d) Games players work aerobically and anaerobically during a game.**

**(i) Give ONE example of a games player working AEROBICALLY in their sport.  
(1 mark)**

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**3 continued.**

- (ii) Give ONE example of a games player working ANAEROBICALLY in their sport.  
(1 mark)**

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- (e) State ONE of the by-products of AEROBIC energy production.  
(1 mark)**

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**(Total for Question 3 = 11 marks)**

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- 4 Look at FIGURE 5 for Question 4 in the Diagram Booklet. It shows a gymnast during their performance of a cartwheel.**

- (a) State the plane and axis used in FIGURE 5 to perform this movement.  
(2 marks)**

**Plane**

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**Axis**

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4 continued.

- (b) State the antagonistic muscle pair acting at the elbow that allow the gymnast to extend the arm at the elbow during the cartwheel.  
(2 marks)

**Agonist**

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**Antagonist**

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**4 continued.**

**(c) State the classification of the joint at the hip.  
(1 mark)**

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**(d) State the type of movement that has occurred at  
the gymnast's hip joints to achieve the position  
shown in FIGURE 5.  
(1 mark)**

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**4 continued.**

- (e) Explain the importance of the short bones in the gymnast's wrists during the movement shown in FIGURE 5.  
(2 marks)**

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**4 continued.**

**(f) Describe the RANGE of movement possible at condyloid joints.**  
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**(Total for Question 4 = 11 marks)**

- 5 Look at FIGURE 6 for Question 5 in the Diagram Booklet. It shows a footballer kicking a football. His right knee and right ankle are circled.**

**Analyse the action of the antagonistic muscle pairs at the CIRCLED joints of the right KNEE and right ANKLE that causes the movement from Position A to Position B in FIGURE 6.**

**(begin your answer on the next page)**



**5 continued.**

### Knee (3 marks)

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**5 continued.**

### Ankle (3 marks)

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**Turn over**

**6 There are three types of health.**

**(a) State the type of health missing from this definition:**

**Health is a state of complete physical and social well-being, and not merely the absence of disease and infirmity.**

**(1 mark)**

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**6 continued.**

**Health, fitness, exercise and performance affect each other because of the relationships between them.**

- (b) (i) State ONE relationship between exercise and performance.  
(1 mark)**

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**6 continued.**

**(ii) State ONE relationship between any TWO of the following:**

- **Health**
- **Fitness**
- **Exercise**

**(1 mark)**

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**Turn over**

**6 continued.**

**An individual's fitness can be improved through the application of the principles of training.**

**Look at FIGURE 7 for Question 6 in the Diagram Booklet. It gives an outline of an individual's training programme.**

**Complete TABLE 3 in the Diagram Booklet by:**

- (c) Giving ONE example of how each of the principles of training could be applied to the training programme in FIGURE 7.**

**Use a DIFFERENT example for each principle.  
(2 marks)**

**(continued on the next page)**

**6 continued.**

**Regular training causes long-term training effects.**

**(d) Explain the benefit of ONE long-term training effect on the CARDIOVASCULAR system for a long-distance runner.**

**(3 marks)**

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**6 continued.**

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**(Total for Question 6 = 8 marks)**

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- 7 An athletics coach uses fitness test results to select the athletics team.**

**Look at TABLE 4 for Question 7 in the Diagram Booklet. It shows the fitness test results for four athletes.**

- (a) State which athlete in TABLE 4 has the highest rating for speed.  
(1 mark)**

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**7 continued.**

- (b) Justify, using the ratings in TABLE 4, why the coach would select Athlete 1 for the 110m hurdling event.  
(2 marks)**

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**7 continued.**

**The 3000m is a long-distance running event.**

**(c) Justify, using the ratings in TABLE 4, which athlete would MOST LIKELY be chosen to run the 3000m.**

**(3 marks)**

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**7 continued.**

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**(Total for Question 7 = 6 marks)**

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- 8 Look at FIGURE 8 for Question 8 in the Diagram Booklet. Explain why the diver in FIGURE 8 could suffer a concussion.**

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**(Total for Question 8 = 2 marks)**

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- 9 Some athletes take performance-enhancing drugs to improve their performance.**

**Complete TABLE 5 in the Diagram Booklet by:**

- (a) Stating the name of the type of performance-enhancing drug from the description of its effect.**

**(2 marks)**

- (b) State the meaning of the term blood doping.**

**(1 mark)**

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**9 continued.**

- (c) Give ONE example of a sport or activity where blood doping may occur.  
(1 mark)**

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**(Total for Question 9 = 4 marks)**

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**10 Look at TABLE 6 for Question 10 in the Diagram Booklet. It shows the different fitness tests carried out by a 10,000m runner and a shot putter.**

- (a) State the component of fitness tested by BOTH performers.  
(1 mark)**

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**10 continued.**

**The 10,000m runner carries out the sit and reach test.**

**(b) Describe how to carry out the sit and reach test.  
(3 marks)**

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**10 continued.**

- (c) Explain ONE reason why a shot putter would use the vertical jump test.  
(2 marks)**

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**10 continued.**

- (d) Justify why the shot putter should change the Cooper 12-minute swim for another fitness test.  
(2 marks)**

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**(Total for Question 10 = 8 marks)**

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**11 Christina plays handball. Each match lasts 60 minutes.**

**Look at TABLE 7 for Question 11 in the Diagram Booklet. It shows three short-term effects of playing handball on Christina's body systems.**

**Evaluate the importance of the three short-term effects listed in TABLE 7 on Christina's handball PERFORMANCE.**

**(9 marks)**

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**11 continued.**

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**11 continued.**

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**(Total for Question 11 = 9 marks)**

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- 12 Mason is a sprinter. Sprinters require high levels of power, speed and reaction time to perform well in their event.**

**Mason trains regularly, using interval training, plyometric training and continuous training.**

**Evaluate the importance of these THREE training methods in improving Mason's fitness to make him a better sprinter.**

**(9 marks)**

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**(Total for Question 12 = 9 marks)**

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**TOTAL FOR PAPER = 90 MARKS**  
**END OF PAPER**